

CLAIMS

Therefore, having thus described the invention, at least the following is claimed:

- 5 1. A ballast water treatment system, comprising a control system and a ballast tank system, wherein the control system controls the concentration of a biocide in the ballast tank system.
2. The ballast water treatment system of claim 1, wherein the ballast water treatment system is implemented in a vessel.
- 10 3. The ballast water treatment system of claim 1 further comprising, a biocide generation system.
4. The ballast water treatment system of claim 1, wherein the biocide is chlorine dioxide.
5. The ballast water treatment system of claim 4, wherein the control system
15 comprises a biocide control program, which is capable of controlling the concentration of the residual chlorine dioxide in the ballast tank system.
6. The ballast water treatment system of claim 5, wherein the biocide control program includes an oxidation-reduction probe that is used to determine the concentration of residual chlorine dioxide.
- 20 7. The ballast water treatment system of claim 1, wherein the control system comprises an organism control program, which is capable of controlling the concentration of the organism in the ballast tank system.

8. A vessel, comprising a control system, a biocide generation system, and a ballast tank system, wherein said control system is capable of controlling the concentration of a biocide in the ballast tank system by controlling the amount of the biocide feed into the ballast tank system from the biocide generation system.
9. The vessel of claim 8, wherein said control system further comprises a biocide control program, which controls the amount of the biocide in the ballast tank system.
10. The vessel of claim 8, wherein said control system further comprises an organism control program, which controls the amount of an organism in the ballast tank system.

11. A method of controlling organisms in ballast water of a vessel, comprising:
- providing the ballast water; and
- treating the ballast water with chlorine dioxide.
12. The method of claim 11 further including,
- providing the chlorine dioxide using a biocide generation system.
13. The method of claim 12, wherein the biocide generation system is located onboard the vessel.
14. The method of claim 12, wherein the biocide generation system is located remote from the vessel.
15. The method of claim 11 further including:
- monitoring the concentration of the chlorine dioxide.
16. The method of claim 15, wherein the monitoring the concentration is performed using an oxidation-reduction probe.
17. The method of claim 11 further including:
- controlling the concentration of the chlorine dioxide.
18. The method of claim 11 further including:
- monitoring the ballast water to determine an extent of treatment of organisms in the ballast water.

19. The method of claim 11 further comprising:

determining a relationship among rate of chlorine dioxide treatment,
period of chlorine dioxide treatment, and requirements for substantial biokill of
organisms within the ballast water charged into the ballast tank system; and

5 treating the ballast water according to said relationship.

20. The method of claim 11, wherein treating the ballast water with chlorine dioxide
further comprises:

treating the ballast water onboard the vessel.

21. The method of claim 11, wherein treating the ballast water with chlorine dioxide
further comprises:

treating the ballast water in a treatment plant remote from the vessel.

22. The method of claim 15, wherein monitoring the concentration of the chlorine
dioxide further comprises:

monitoring the concentration of the chlorine dioxide in a treatment plant
remote from the vessel.

23. The method of claim 17, wherein controlling the concentration of the chlorine
dioxide further comprises:

controlling the concentration of the chlorine dioxide in a treatment plant
remote from the vessel.

24. The method of claim 18, wherein monitoring the ballast water to determine an extent of treatment of organisms in the ballast water further comprises:

monitoring the ballast water to determine an extent of treatment of organisms in the ballast water in a treatment plant remote from the vessel.

25. A ballast water treatment system on a computer-readable medium for controlling organisms in ballast water of a vessel, comprising:

logic configured to enable the ballast water to be provided; and

logic configured to enable the ballast water to be treated with chlorine

dioxide.

26. The ballast water treatment system of claim 25 further comprising:

logic configured to enable the chlorine dioxide to be provided using a biocide generation system.

27. The ballast water treatment system of claim 25, further comprising:

logic configured to enable the concentration of the chlorine dioxide to be monitored.

28. The ballast water treatment system of claim 25, further comprising:

logic configured to enable the concentration of the chlorine dioxide to be controlled.

29. A system for controlling organisms in ballast water of a vessel, comprising:

means for providing the ballast water; and

means for treating the ballast water with chlorine dioxide.

30. The system of claim 29 further including,

5 means for providing the chlorine dioxide using a biocide generation system.

31. The system of claim 29 further including:

means for monitoring the concentration of the chlorine dioxide.

32. The system of claim 29 further including:

10 means for controlling the concentration of the chlorine dioxide.

33. The system of claim 29 further including:

means for monitoring the ballast water to determine an extent of treatment of organisms in the ballast water.

34. A modular biocide generation system, comprising:

a container that is fireproof and waterproof and includes:

a plurality of precursor chemical storage tanks for storing precursor chemicals;

5 a reaction tank for reacting the precursor chemicals where the reaction tank is connected to the plurality of precursor chemical storage tanks;

10 an intake valve for receiving motive water, wherein the motive water is capable of creating a vacuum to facilitate the mixing of the precursor chemicals in the reaction tank to form a biocide; and

a discharge valve for discharging the motive water and the biocide.